39-21(3779)B
MTC 6692.1
PATENT

IN THE CLAIMS:

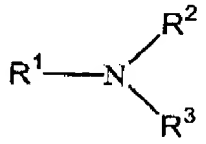
1. (currently amended) A method of enhancing herbicidal activity of a glyphosate herbicide, comprising adding to said glyphosate herbicide a first surfactant and a second surfactant to form a composition consisting essentially of glyphosate, a first surfactant, and a second surfactant at a weight ratio of total surfactant to glyphosate acid equivalent of about 1:30 to about 2:1, wherein said first surfactant has a chemical structure comprising a cationic or protonatable amino group and a C_{8-24} hydrocarbyl group, and said second surfactant has the chemical formula

$$R\text{-}CO\text{-}NR'\text{-}(CR'_2)_n\text{-}COOM$$

where R is a C_{7-23} hydrocarbyl group, n is 1 to 4, M is hydrogen or a cationic counterion, and R' groups are each independently hydrogen, C_{1-4} alkyl or a group $-(CH_2)_m-COOM$ where m is 1 to 4 and M is as defined immediately above, with the proviso that no more than one R' group is such a group $-(CH_2)_m-COOM$ and the weight ratio of said first surfactant to said second surfactant being about 1:10 to about 10:1.

2. (currently amended) The method of Claim 1 wherein said first surfactant is selected from: a tertiary alkylamine and alkyletheramine; polyoxyethylene tertiary alkylamine and alkyletheramine ~~alkyletheramine~~; quaternary ammonium; pyridine; imidazoline; polyoxyethylene alkylamine and alkyletheramine oxide; an alkylbetaine; and alkyl diamine and a polyoxyethylene alkyl diamine.

3. (original) The method of Claim 1 wherein said first surfactant is a tertiary alkylamine or alkyletheramine surfactant having the chemical formula



where R^1 is a C_{8-24} hydrocarbyl group, optionally interrupted by one or more ether linkages, and R^2 and R^3 are (a) independently C_{1-4} alkyl groups, or (b) polyoxyalkylene chains having in total 2 to about 100 C_{2-4} alkylene oxide units.

4. (original) The method of Claim 3 wherein R^1 is a C_{12-18} hydrocarbyl group and R^2 and R^3 are polyoxyethylene chains having in total 2 to about 100 ethylene oxide units.

5. (original) The method of Claim 1 wherein, in the chemical formula for said second surfactant, the group R-CO- is a C_{12-18} linear acyl moiety derived from one or more fatty acids.

6. (original) The method of Claim 1 wherein said second surfactant is an N-(C_{12-18} linear acyl) derivative of an α-amino acid.

7. (original) The method of Claim 6 wherein said α-amino acid is selected from alanine, aspartic acid, glutamic acid, glycine, isoleucine, leucine, sarcosine and valine.

8. (original) The method of Claim 6 wherein said α-amino acid is sarcosine.

9. (original) The method of Claim 1 wherein said first surfactant and said second surfactant are present in a weight ratio of about 1:5 to about 5:1.

10. (original) The method of Claim 1 wherein the weight ratio of total surfactant to glyphosate acid equivalent is about 1:10 to about 1:1.

11. (original) The method of Claim 1 wherein the weight ratio of total surfactant to glyphosate acid equivalent is about 1:6 to about 1:2.

12. (original) The method of Claim 1 wherein the glyphosate herbicide is a water-soluble salt of glyphosate with a monovalent counterion.

13. (original) The method of Claim 12 wherein the salt of glyphosate is selected from sodium, potassium, ammonium, C_{1-16} organic ammonium and C_{1-16} organic sulfonium salts.

14. (original) The method of Claim 12 wherein the salt of glyphosate is selected from sodium, potassium, ammonium, dimethylammonium, monoethanolammonium, n-propylammonium, isopropylammonium and trimethylsulfonium salts.

15. (currently amended) A herbicidal composition consisting essentially of ~~comprising~~ (a) a glyphosate herbicide; (b) a first surfactant having a chemical structure comprising ~~consisting essentially of~~ a cationic or protonatable amino group and a C_{8-24} hydrocarbyl group; and (c) a second surfactant having the chemical formula

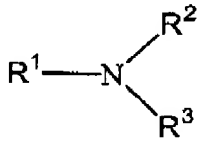
$$R\text{-}CO\text{-}NR'\text{-}(CR'_2)_n\text{-}COOM$$

where R is a C_{7-23} hydrocarbyl group, n is 1 to 4, M is hydrogen or a cationic counterion, and R' groups are each independently hydrogen, C_{1-4} alkyl or a group $-(CH_2)_m\text{-}COOM$ where m is 1 to 4 and M is as defined immediately above, with the proviso that no more than one R' group is such a group $-(CH_2)_m\text{-}COOM$; the weight ratio of said first surfactant to said second surfactant being about 1:10 to about 10:1, and the weight ratio of total surfactant to glyphosate acid equivalent being about 1:30 to about 2:1.

16. (currently amended) The composition of Claim 15 wherein said first surfactant is selected from: tertiary alkylamine and alkyletheramine; polyoxyethylene tertiary alkylamine and

alkyletheramine ~~alkyletheramine~~; quaternary ammonium; pyridine; imidazoline; polyoxyethylene alkylamine and alkyletheramine oxide; an alkylbetaine; and alkyl diamine and polyoxyethylene alkyl diamine.

17. (original) The composition of Claim 15 wherein said first surfactant is a tertiary alkylamine or alkyletheramine surfactant having the chemical formula



where R^1 is a C_{8-24} hydrocarbyl group, optionally interrupted by one or more ether linkages, and R^2 and R^3 are (a) independently C_{1-4} alkyl groups, or (b) polyoxyalkylene chains having in total 2 to about 100 C_{2-4} alkylene oxide units.

18. (original) The composition of Claim 17 wherein R^1 is a C_{12-18} hydrocarbyl group and R^2 and R^3 are polyoxyethylene chains having in total 2 to about 100 ethylene oxide units.

19. (original) The composition of Claim 15 wherein, in the chemical formula for said second surfactant, the group R-CO- is a C_{12-18} linear acyl moiety derived from one or more fatty acids.

20. (original) The composition of Claim 15 wherein said second surfactant is an N-(C_{12-18} linear acyl) derivative of an α-amino acid.

21. (original) The composition of Claim 20 wherein said α-amino acid is selected from alanine, aspartic acid, glutamic acid, glycine, isoleucine, leucine, sarcosine and valine.

22. (original) The composition of Claim 20 wherein said α-amino acid is sarcosine.

23. (original) The composition of Claim 15 wherein said first surfactant and said second surfactant are present in a weight ratio of about 1:5 to about 5:1.

24. (original) The composition of Claim 15 wherein the weight ratio of total surfactant to glyphosate acid equivalent is about 1:10 to about 1:1.

25. (original) The composition of Claim 15 wherein the weight ratio of total surfactant to glyphosate acid equivalent is about 1:6 to about 1:2.

26. (original) The composition of Claim 15 wherein the glyphosate herbicide is a water-soluble salt of glyphosate with a monovalent counterion.

27. (original) The composition of Claim 26 wherein the salt of glyphosate is selected from sodium, potassium, ammonium, C_{1-16} organic ammonium and C_{1-16} organic sulfonium salts.

28. (original) The composition of Claim 26 wherein the salt of glyphosate is selected from sodium, potassium, ammonium, dimethylammonium, monoethanolammonium, n-propylammonium, isopropylammonium and trimethylsulfonium salts.

29. (original) The composition of Claim 15 that is a dilute aqueous plant treatment composition having a glyphosate acid equivalent content of about 0.1% to about 10% by weight.

30. (original) The composition of Claim 15 that is an aqueous concentrate composition having a glyphosate acid equivalent content of about 10% to about 50% by weight.

31. (original) The composition of Claim 15 that is a dry water-soluble or water-dispersible composition having a glyphosate acid equivalent content of about 5% to about 80% by weight.

32. (original) A method of killing or controlling weeds comprising application to foliage of said weeds a composition of Claim 29 in a volume of about 25 to about 1000 l/ha.